

# **Does 401(k) Loan Repayment Crowd Out Retirement Saving? Implications for Plan Design**

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## **Does 401(k) Loan Repayment Crowd Out Retirement Saving? Implications for Plan Design**

### *Abstract*

Using data from Vanguard 401(k) plans, we establish a new empirical fact: retirement plan contributions are remarkably stable after loans and hardship withdrawals. Relative to a control group, loan takers' contribution rates fall by just 0.8 percentage points in the two years following loan issuance, despite simultaneously making large loan repayments. Relatedly, most participants continue making elective contributions after hardship withdrawals. For plan sponsors considering the introduction of penalty-free emergency withdrawals newly permitted under SECURE 2.0, our results suggest that most participants would be able to access this liquidity feature while maintaining their long-term retirement savings through an 'automatic repayment' feature.

Keywords: 401(k) plans, 401(k) loans, retirement saving, hardship withdrawals, emergency withdrawals.

JEL Codes: G50, G51, H31, J26, J32

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## **Does 401(k) Loan Repayment Crowd Out Retirement Saving? Implications for Plan Design**

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In the United States, 401(k) plans serve not only as vehicles for long-term retirement saving, but also as sources of short-term liquidity. For instance, in 2023, among plans for which Vanguard was the recordkeeper, 10 percent of participants accessed their plan assets via either a loan or hardship withdrawal.<sup>1</sup> Similarly, Beshears et al. (2012) and Lu et al. (2017) found that over 40 percent of 401(k) participants took at least one loan over a five-to-seven-year period. Recent legislative changes under SECURE 2.0, including the emergency withdrawal provision allowing participants to take annual penalty-free distributions of up to \$1,000, are likely to increase early withdrawals in coming years. As more participants use 401(k) assets to fund emergency spending needs, it is important to understand the tradeoffs between liquidity and long-run wealth accumulation.

This chapter examines the extent to which utilization of 401(k) liquidity features reduces ongoing 401(k) contributions. Answering this question requires a joint analysis of distribution and contribution behavior not found in prior empirical work in the 401(k) literature.<sup>2</sup> Leveraging administrative data covering Vanguard's recordkeeping population, we study participants taking loans and hardship withdrawals, and we establish a new empirical fact: elective contributions are remarkably stable after liquidity-based distributions. Participants accessing their assets during employment usually did not elect to reduce their contribution rates, with roughly three-quarters of loan and hardship withdrawal takers maintaining or increasing their contribution rates in the two years following the distribution. Relative to a control group of observably similar participants who did not take a loan, loan takers' average contribution rates fell by only 0.8 percentage points over

a two-year horizon. This stability of contributions holds across the income and loan size distributions, as well as for hardship withdrawal takers who were not subject to mandatory contribution suspensions.

Our results have implications for the implementation of the optional emergency withdrawal feature newly permitted under SECURE 2.0. Beginning in 2024, plan sponsors may allow participants to take penalty-free withdrawals of up to \$1,000 per calendar year for ‘unforeseeable or immediate financial needs relating to necessary personal or family emergency expenses.’<sup>3</sup> The lack of a 10 percent tax penalty—along with the self-certification of financial need<sup>4</sup>—makes the new emergency withdrawals a uniquely flexible liquidity option that could yield high participant usage rates at adopting employers. This additional liquidity is valuable to participants facing pressing spending needs, but the potential for increased withdrawal activity raises the risk of substantial retirement saving leakage (i.e., reductions in retirement savings account balances driven by participants’ decisions to access their balances prior to retirement).

Our empirical findings point toward practical steps that plan sponsors could take to reduce unnecessary leakage arising from the new emergency withdrawals. One effective intervention would be an ‘automatic repayment’ feature that encouraged or defaulted participants into repaying the withdrawals through payroll deferrals incremental to their elective contributions, essentially treating the withdrawal as if it were a loan.<sup>5</sup> The stability of elective contributions after loan issuance suggests that emergency withdrawal takers would also repay the withdrawn amount while maintaining their previous contribution rates.

We find that most participants could pay back a \$1,000 withdrawal within a two-year period via a two-percentage-point increase in their contributions. Automatic repayment, which could be implemented with designated repayment transactions or with a small increase in the

elective contribution rate, would nudge participants to replenish their retirement accounts in a timely manner and ensure that the withdrawn funds resume earning market returns. Maintaining elective deferrals during the repayment period would prevent unnecessary saving reductions and ensure that participants do not miss out on valuable employer matching contributions.

Like other aspects of participant behavior, our results are probably partially driven by participants' passive adherence to plan defaults. In the absence of automatic contribution suspensions (which are rarely used for loans and prohibited for hardship withdrawals from 2020 onward), the default path for contribution rates is to continue on their pre-distribution trajectory. Indeed, about 40 percent of the loan and hardship withdrawal takers in our sample see their contribution rates automatically *escalated* during the two-year period following the distribution. Downward contribution adjustments require an active choice from participants, which in most cases is not forthcoming.

Because loan repayments are generally collected through mandatory payroll deferrals, the stability of elective contribution rates implies that loan takers experience large increases in their total deferral rates (contributions plus repayments) at the time of the loan issuance. This fact, along with participants' tendency toward default adherence, presents intriguing possibilities for the design of the plan loan feature itself. For example, plan sponsors could encourage or default participants who have successfully paid off a loan into an elective contribution increase, to maintain a portion of the increased total deferral rate that occurred during the loan repayment period. Successful repayment histories effectively reveal participants' ability to support higher deferral rates, and, given the substantial size of loan repayments (about 6% of income on average), policies that act on this information to raise ongoing contribution rates could achieve meaningful increases in retirement wealth accumulation. Successful repayment could provide particularly

valuable information about savings capacity for less engaged participants whose pre-loan contribution rates were set by plan defaults rather than active choices.

An important limitation of our analysis is our lack of broader household financial data. Because we can only track participants' financial activity within the 401(k) plan, we cannot speak to adjustments that might occur in other parts of their household budgets. In particular, it is possible that loan takers finance a portion of their increased payroll deferral burden by cutting back on essential spending needs, leaving bills unpaid, or taking on credit card debt. The margins on which budgets adjust as a consequence of loan repayment affect the normative implications of the observed stable contribution activity. The consistency of our main empirical results across the income and loan size distributions partially addresses this concern: if loan repayment caused household financial stress, we might expect to see at least some of that stress appear for the lower-income participants and smaller loans in our sample. The design of an automatic repayment system also matters: making contribution increases for loan and emergency withdrawal takers the default, but not mandatory, gives participants experiencing household financial stress the freedom to opt out.

The remainder of the chapter is organized as follows. First, we describe the administrative 401(k) data and our event study approach to analyzing loan takers' contribution rates. Next, we present the main empirical results, followed by discussion of our results. A final section concludes.

## **Data and Methodology**

**Vanguard administrative data.** We use anonymized administrative 401(k) plan data from Vanguard. This database includes all information that Vanguard collects in the normal course of its recordkeeping responsibilities, including employee hire and separation dates, employee

contribution rates, employee and employer contribution transactions, loan issuances and repayments, and hardship withdrawals and other distributions. Vanguard administers over 1,700 plans covering roughly 5 million participants. Because our primary empirical focus is on loan repayment, most of the analysis is restricted to a slightly smaller set of about 1,400 plans that offer loans. Since larger plans are more likely to offer loans, this subset contains over 90 percent of the participants in Vanguard plans.<sup>6</sup>

**Sample timeframes.** We track the contribution behavior of loan takers for two years following loan issuance. As a result, the most recent set of loan takers we track had loans issued in December 2021. The first sample is formed by extending the loan issuance timeframe back through the beginning of the calendar year, and we consider all participants issued a plan loan in 2021. Taking December 2019 as the last month of pre-pandemic contribution activity, we define the pre-pandemic sample as participants with loans issued in 2017. Analyzing recent cohorts of loan takers requires us to use data from the Covid-19 pandemic period. To ensure that our findings are relevant outside of this period, we analyze both a recent sample of loans issued in 2021, and also a pre-pandemic sample of loans issued in 2017. As shown below, the empirical results are quite similar for the 2017 and 2021 samples; contribution crowd-out during loan repayment was in fact slightly smaller for the more recent 2021 sample. The similarity of our results across the two time periods suggests that participants' ability to maintain elective deferrals while repaying loans is a durable empirical pattern.

Though contribution behavior during loan repayment is our primary focus, contribution behavior after hardship withdrawals (which tend to be smaller than loan amounts and used for purposes similar to the new emergency withdrawals) is also informative. We supplement our

analysis by studying the contribution activity of participants who took hardship withdrawals during the same 2017 and 2021 timeframes.

**Summary statistics.** Table 1 gives summary statistics for the loan and hardship withdrawal takers in Vanguard plans. The median loan taker is just over 40 years old with a plan tenure of five years and annual income around \$60,000. The average loan amount is about \$10,000 in 2017 and about \$12,000 in 2021; given the skewness of the loan size distribution, the corresponding median loan amounts are substantially smaller (\$6,000 in 2017 and roughly \$7,000 in 2021). Small loans approximating the size of the new emergency withdrawals are relatively rare but still common enough to study empirically: the 10th percentile of the loan size distribution in both samples is just over \$1,000.

*Table 1 here*

Because hardship withdrawals are less common than plan loans, the hardship withdrawal samples are significantly smaller than the loan samples. Hardship withdrawals are also noticeably smaller in dollar terms: median withdrawal amounts are below \$3,000 in both the 2017 and 2021 samples, and roughly 25 percent of withdrawals are smaller than the new \$1,000 emergency withdrawal limit. Finally, hardship withdrawal takers had slightly lower incomes than loan takers, with median values about \$8,000 less than the corresponding figures for the loan samples.

**Event study of loan takers.** For each loan taker in the 2017 and 2021 samples, we analyze contribution behavior—the participants' elected contribution rates<sup>7</sup>—for six months prior to and 24 months after loan issuance. We restrict the event study analysis to loan takers still employed at the same plan sponsor 24 months after issuance (thereby eliminating cases where contribution rates dropped to zero for separated employees). If a participant took multiple loans during either of our 2017 or 2021 sampling timeframes, we index event time relative to the participant's first such loan.



Changes in loan takers' contribution rates over time may reflect a variety of factors, including macroeconomic shocks, changes in participant incomes, and plan-specific features such as annual automatic-escalation policies, among others. To focus on contribution rate changes that we can plausibly attribute to the effect of the loan issuance itself, we compare loan takers to a control group of participants who did not take loans during the specified timeframes, but who were otherwise similar in plan tenure, age, income, and initial contribution rate. Specifically, we match each loan taker to one control participant who:

- was in the same plan as the loan taker,
- was employed at the same plan sponsor 24 months after the relevant loan issuance,
- did not take any loans or hardship withdrawals in the six months before or during the month of the relevant loan issuance,
- had the same tenure (measured as whole years since plan entry) as the loan taker at the time of the relevant loan issuance,
- had an absolute age difference with the loan taker of five years or less,
- had an absolute income difference with the loan taker of 25 percent or less at the time of the relevant loan issuance,
- and had the same elected contribution rate as the loan taker six months before the relevant loan issuance.

If multiple potential control participants satisfy all of these criteria, we chose one randomly; if no suitable control participants existed, we excluded the relevant loan taker from our event study analysis. Because we screen for loans and hardship withdrawals only in the six months before the relevant loan issuance, it is possible for a control participant to take a loan or hardship withdrawal after their matched loan taker's loan issuance (or outside of our 31-month timeframe altogether).

Online Appendix Table A.1 shows how our sample size is affected by each of the filtering steps taken when moving from the full 2017 and 2021 loan issuance samples to the subsamples analyzed in our event study. Restricting to loan takers who are still employed 24 months after issuance drops about 20 percent of participants. A small minority of plan sponsors do not report participants' elected contribution rates (our main outcome variable) to Vanguard; dropping participants from these plans causes another small reduction in sample size. After successfully matching about 60 percent of the remaining loan takers to suitable control participants, we are left with 137,698 loan takers in the 2017 sample, and 114,752 in the 2021 sample. We restrict attention to this smaller matched sample only in analyses that compare loan takers' contribution rates and those of the control group.

## Results

**Finding 1: Contribution activity is remarkably stable during and after loan origination and hardship withdrawals.** Loan repayment patterns and voluntary contribution changes among our samples indicate that participants did maintain their previous contribution levels even after taking liquidity-based distributions. Those who took loans or hardship withdrawals rarely reduced their contribution rates after the distribution. Moreover, the vast majority of 401(k) loan takers who remained employed long enough to repay their loans through payroll deferrals did so successfully.

To illustrate these points, we first compute default rates for the 401(k) loans in our sample.<sup>8</sup> Because loan repayment periods can stretch up to five years, it is important to note that we only capture defaults occurring within our two-year post-issuance period. The default rate was 4% among participants still employed at the lending plan's sponsor two years after issuance; among participants who separated within this two-year period, the default rate was 71%. The disparity in

default rates between the two groups echoes similar findings from prior research using Vanguard recordkeeping data (Lu et al. 2017) and is likely attributable to employers' ability to require that the full amount of outstanding loan balances be repaid at the time of separation. In the case of the new emergency withdrawals under SECURE 2.0, the optional nature of repayment means there would be no requirement from the plan sponsor (or tax-penalty incentive for the participant) to accelerate repayment at the time of separation. The share of participants in the 2017 sample defaulting during employment was slightly higher, at 10%.

Changes in elective contribution rates after loan issuance provide additional information about participants' repayment capacity. In particular, voluntary decreases in contribution rates could indicate that loan repayment stressed participants' finances or otherwise interfered with their ability to save for retirement. Figure 1 demonstrates that voluntary decreases were not typical, as only 26% of loan takers and 24% of hardship withdrawal takers in the 2021 sample voluntarily decreased their contribution rate at any point in the two years following loan issuance. The share of participants who voluntarily *increased* their contribution at any point during the two-year post-issuance period was essentially the same, with 26% of loan takers and 24% of hardship withdrawal takers doing so. The most common type of contribution rate change (affecting 38% of loan takers and 41% of hardship withdrawal takers) was automatic escalation, a common feature of automatic-enrollment plans that usually raises participant contribution rates by one or two percentage points on an annual basis.<sup>9</sup>

*Figure 1 here*

Contribution rate changes during the two-year post-issuance period for both the 2017 and 2021 samples are provided in Online Appendix Figures A.1 and A.2. Voluntary changes are similar across the two samples; the most important difference is the share of hardship withdrawal takers

whose contributions were suspended in 2017 versus 2021. Suspensions are distinct from voluntary decreases and occur when a participant's contribution rate is automatically set to zero by the plan sponsor. Prevailing IRS rules in 2017 required many plan sponsors to suspend employee contributions for the six months following a hardship withdrawal; as a result, the suspension rate in our 2017 sample was 80%. This requirement was eliminated in 2019 and the suspension rate in our 2021 sample dropped to near zero. There was only a slight rise in voluntary decreases among the 2021 sample (in which 24% of participants had a voluntary decrease, versus 21% in the 2017 sample), suggesting that the pre-2019 rules mostly did not suspend participants who otherwise would have chosen to lower their contribution rates. Participants thus appeared willing and able to continue their normal contribution activity even after hardship withdrawals that often occur during periods of significant household financial stress.

**Finding 2: 401(k) loan takers are able to sustain their retirement saving during repayment, regardless of loan size.** Loan takers' contribution rates (beyond their loan repayment amounts) decreased by only a small amount relative to the control group, indicating that most participants could maintain their elective contribution activity even while repaying loans. Contribution rates were similarly stable for hardship withdrawal takers when they were not subject to mandatory contribution suspensions.

Figure 2 illustrates our central finding: elective contribution rates were remarkably stable around and after loan issuance. Focusing on loans for \$1,000 or less in the 2021 sample, we show average contribution rates and loan repayment amounts as a percent of monthly income over the course of our 31-month timeframe. Repayment amounts rose from zero in the month of loan issuance to a peak of about 2.5% of income, then gradually decreased as participants with the shortest repayment schedules began to pay off their balances. Elective contribution rates showed

little change during the repayment period. After increasing gradually during the pre-issuance period, the contribution rate peaked during the month of issuance, decreased slightly, then stabilized. Two years after loan issuance, contribution rates were roughly the same as a few months before issuance.

*Figure 2 here*

Figure 3 expands our analysis of post-issuance contribution behavior by considering all loans in the 2021 sample and comparing loan takers' elective contribution rates to those of their matched control participants. Because it makes a comparison to the control group, Figure 3 (along with Figure 4) restricts to the subset of loan takers who were successfully matched to a control participant. Once again, our main empirical finding is evident: loan takers' contribution rates decreased by a small amount relative to the control group. In the six months before issuance, loan takers and control participants followed the same upward trajectory (the result of annual automatic escalation policies and voluntary increases that generally caused contribution rates to trend upward over time). At the time of loan issuance, loan takers' contribution rates showed a slight decrease, then flattened out, and eventually stabilized just above their initial level. Control participants maintained their gradual contribution growth through the entire 31-month timeframe. The net result at the end of the two-year post-issuance period was that loan takers' contribution rates fell by about 0.8 percentage points relative to the control group. As mean contribution rates began at roughly 8 percentage points, this represents a proportional decrease of about 10%, but the decline was relatively small compared to the contemporaneous loan repayment amounts.

*Figure 3 here*

Figure 4 displays contribution crowd-out separately for four categories of loan size. It shows that the stability of loan takers' elective contributions was consistent across the loan size

distribution. Contribution crowd-out evolved similarly for all four groups, and it was modestly increasing in loan size: at 24 months, participants taking loans for \$1,000 or less fell 0.5 percentage points behind the control group, and those taking loans for \$10,000 or more fell 1.0 percentage point behind. Since the loans in our sample most similar to the new emergency withdrawals were those for \$1,000 or less, Figure 4 implies that the main empirical finding of limited crowd-out is just as relevant for likely emergency withdrawal takers as it is for the full participant population. Online Appendix Figure A.3 further splits the sample by participant income, and similarly it shows that contribution crowd-out was smaller for those with lower incomes.

*Figure 4 here*

Additional contribution and repayment results are provided in the Online Appendix. Figure A.4 shows that our main crowd-out results were similar for the 2017 pre-pandemic sample. Figure A.5 converts the loan taker-control comparison from Figure 3 into regression form and demonstrates that the crowd-out estimates are precise (the standard error of the loan taker effect is about 2 basis points). Figure A.6 shows that contribution crowd-out was generally larger (though still around 1 percentage point at 24 months) among loan takers whose initial contribution rate was strictly higher than their employer's matching contribution cap. Since participants above the cap did not lose employer matching contributions when making marginal decreases in their contribution rate, they may have had less of an incentive to maintain their elective contributions, and the slightly larger crowd-out for them is sensible. This relationship held for larger loans, but among the loans for \$1,000 or less most comparable to the new emergency withdrawals, participants' placement relative to their employer's match cap did not appear to be a good predictor of contribution crowd-out.

Focusing on the extensive margin (i.e., the share of participants who made any voluntary decrease in their contribution rate), Figure A.7 shows that two years after issuance, the share of loan takers with at least one voluntary decrease was 12 percentage points higher than among control participants, indicating that only about half of the voluntary decreases documented in Figure 1 were incremental to the control group. Figure A.8 shows participants' total deferral rates (elective contributions plus loan repayments). The stability of loan takers' elective contributions as loan repayment began caused their mean total deferral rate to rise by about 4 percentage points at the time of loan issuance, and it remained 3 percentage points above the control group after 24 months.

**Finding 3: Hardship withdrawal takers maintained their retirement saving and benefited from employer matches when their elective contributions were not suspended.** Next we exploit a recent policy change concerning hardship withdrawals to better understand the sensitivity of contribution behavior to plan defaults. Prior to 2019, IRS rules required many plan sponsors to suspend employee contributions for the six months following a hardship withdrawal. Accordingly, 80% of participants who took a hardship withdrawal in the 2017 sample were subject to a mandatory six-month contribution suspension following the withdrawal, compared to almost no one in the 2021 sample.

Figure 5 shows how contribution rates evolved for participants in the 2017 and 2021 hardship withdrawal samples. The effect of the policy change is clearly visible. Mean employee contribution rates in the 2017 sample fell by 3.7 percentage points immediately after the withdrawal, then increased at the six-month mark and eventually regained their pre-withdrawal level.

*Figure 5 here*

Figure 5 also illustrates a crucial additional cost arising from interruptions in employee contributions: foregone employer matching contributions. For participants in the 2017 sample, the total decrease in retirement saving during the six months following the withdrawal was 6.7 percentage points, after accounting for a drop in employer contributions of 3 percentage points.<sup>10</sup> By contrast, in the 2021 sample, which was not subject to mandatory suspensions, employee contribution rates were comparatively stable, decreasing slightly over the 18 months following the withdrawal before flattening out and remaining just below their initial level. The 2021 contribution path constitutes additional evidence that participants could maintain elective contributions after taking liquidity-based distributions, when plan rules allowed them to do so.

**Finding 4: Most participants can repay a \$1,000 withdrawal over the course of two years through a two-percentage-point increase in their contributions.** In light of the SECURE 2.0 provision allowing emergency withdrawals of up to \$1,000, it is useful to examine potential automatic repayment timeframes. Loans for \$1,000 or less, which approximate the size of the new SECURE 2.0 emergency withdrawals, and may be more likely to arise from short-term liquidity needs, were typically repaid within one to two years.

Observed repayment periods for 401(k) loans, often selected by the loan takers themselves, can be a useful guide to understand participants' repayment capacity. IRS rules generally require that loans be repaid within five years. As Figure 6 demonstrates, most of the smaller loans in our sample were repaid well in advance of this five-year limit. For loans of \$1,000 or less, 50% were fully repaid within 12 months, 65% within 18 months, and 74% percent within 24 months. Among loans between \$1,000 and \$5,000, 42% were repaid within 18 months, and 55% within 24 months. Most participants taking small and modest-sized loans thus appeared willing and able to repay over timelines of one to two years.



*Figure 6 here*

The preceding contribution and repayment results suggest that most emergency withdrawal takers could repay the withdrawal while maintaining their previous elective contributions. Since most loans for \$1,000 or less were repaid within one to two years, 18 months is a natural time period for emergency withdrawal repayment. One way to administer repayment would be to treat the emergency withdrawal in the same way that recordkeepers currently treat loans: that is, to specify a repayment length (e.g., 18 months), calculate the exact amount that must be deferred from each paycheck to repay over the specified timeline, and deduct that amount from future paychecks in addition to the participant's elective contributions. Another option, which might be easier for some recordkeepers to implement, is to increase participants' elective contribution rates by a small amount at the time of the withdrawal.<sup>11</sup> An integer increase in the elective contribution rate (i.e., one or two percentage points) would yield similar repayment profiles as an exact repayment schedule, but it would not require recordkeepers or participants to calculate the precise payroll deferral amount necessary to repay within a given timeframe.<sup>12</sup>

Figure 6 additionally shows how an integer contribution rate increase would operate given the distribution of incomes in the 2021 loan taker sample. We limit to the income distribution among participants taking loans of \$1,000 or less, since this group tends to have lower incomes and may better represent future emergency withdrawal takers than the full loan taker sample. A two-percentage-point increase appears to be a useful reference point, as it would ensure that 63% of participants repay a \$1,000 withdrawal within 18 months, and that 82% repay within 24 months. A one-percentage-point increase produces only an 11% repayment rate at 18 months, so this could therefore be more appropriate for participants with above-average incomes.

## Discussion

We study 401(k) participants taking loans and hardship withdrawals from their 401(k) plans because their contribution behavior provides policy-relevant insights for plan sponsors and recordkeepers. Elective contributions are remarkably stable around and following loans and hardship withdrawals, indicating that participants can maintain their normal retirement saving activity after tapping their 401(k) assets for liquidity purposes. In the case of plan loans -- where elective contributions occur on top of mandatory repayments -- stable contribution rates imply sharp increases in total deferral rates at the time of loan issuance. Even so, the vast majority of loan takers who remain employed long enough to repay their loans through regular payroll deferrals, do so successfully.

For plan sponsors considering the introduction of penalty-free emergency withdrawals under SECURE 2.0, our findings suggest that most participants could repay these withdrawals while maintaining their previous elective contribution rates. Given that most of the smaller loans in our analysis were repaid within one to two years, we view repayment over 18 months as a natural starting point for an emergency withdrawal repayment schedule. A two-percentage-point increase in the elective contribution rate, which could be easier for recordkeepers to implement than an exact dollar repayment schedule, would ensure that most participants repaid a \$1,000 withdrawal within 18 months. Faster repayment schedules can ensure that withdrawn funds begin earning market returns sooner, but circumstances for individual participants may warrant different repayment timelines.

Important technical considerations would accompany the implementation of automatic repayments. First, as noted above, repayment could occur through explicit repayment transactions with an exact amortization schedule or via an increase in elective contribution rates. These two

repayment methods have similar tax consequences for most participants,<sup>13</sup> and both methods reestablish participants' eligibility for future emergency withdrawals.<sup>14</sup> Because the two methods are largely equivalent from the participant's perspective, plan sponsors could implement repayment policies using whichever method they find easiest to adopt within their administrative and recordkeeping systems.

A major potential difference between the two repayment methods is that the employer match structure applied to explicitly designated repayments might differ from the match structure applied to elective contributions.<sup>15</sup> Nevertheless, plan sponsors are likely to find it easier to apply a single employer match structure to the sum of explicitly designated repayments and elective contributions. Since the two repayment methods are largely equivalent from participants' perspective, offering an employer match for one type of deferral but not the other could create an essentially dominated alternative and allow participants to make costly financial mistakes. Implementing repayment through incremental elective contributions (which always earn employer matches) would have the benefit of ensuring that participants were not presented with dominated choices.

The presence of employer matching contributions gives rise to another technical consideration for plan sponsors contemplating the introduction of emergency withdrawals: the risk of participant strategic gaming behavior. If repayments are match-eligible, then participants without actual liquidity needs could withdraw and quickly repay funds, earning additional employer matches without making net contributions to the plan (and without incurring taxes or penalties). Making explicit repayments match-ineligible would not prevent all such gaming behavior, as participants could also repay with match-eligible elective contributions. Plan sponsors

therefore must determine whether the risk of undesirable gaming behavior outweighed the liquidity value their participants would derive from the new emergency withdrawals.<sup>16</sup>

Finally, for the substantial number of participants who take new loans each year, our empirical results may justify interventions aimed at increasing long-run retirement wealth accumulation. Plan sponsors generally have limited financial information about their participants: age and individual income are usually known, but household-level income, spending needs, total assets, and debt are almost always unknown. As a result, identifying the optimal contribution rate for any given participant is exceedingly difficult, and the default contribution rates embedded in automatic-enrollment plans must be appropriate for a wide range of participants. Loan repayment provides a unique opportunity to bypass this missing-information problem and directly observe whether participants are capable of increasing their deferral rates for sustained periods of time. Participants who successfully repay loans without decreasing their elective contributions demonstrate that they have this capability. By actively encouraging or defaulting these participants into elective contribution increases that make permanent a portion of the additional repayment deferrals, plan sponsors can nudge them toward higher savings rates that are demonstrably within their reach. Even a policy that maintained half of the average loan repayment amount in our sample (6 percent of income) would make a meaningful difference in retirement readiness.

## **Conclusion**

Using administrative data from Vanguard 401(k) plans, we show that participant contribution behavior is remarkably stable around and following loans and hardship withdrawals. This stability of contribution rates likely arises from participants' passive adherence to plan defaults and invites interventions from plan sponsors aimed at increasing long-run retirement

saving. Among such interventions, we consider policies that automate the repayment of new penalty-free emergency withdrawals and that raise contribution rates after successful loan repayment.

## Notes

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<sup>1</sup> This calculation is restricted to plans offering loans and is based on the Vanguard 401(k) administrative data described below.

<sup>2</sup> Wenger and Weller (2014) and Mitchell et al. (2007) are notable because they study whether the availability of plan loans increases participation and saving rates in 401(k) plans, but they do not analyze changes in contribution behavior after loan issuance.

<sup>3</sup> Consolidated Appropriations Act of 2023, H.R. 2617, Section 114. In addition to emergency withdrawals, SECURE 2.0 also permitted employers to establish Pension Linked Emergency Savings Accounts (PLESAs) that enable employees to save for short-term needs through Roth payroll deferrals. We focus our policy discussion on the penalty-free emergency withdrawal feature because it is easier to implement than PLESAs and thus more likely to be taken up by employers in the near term.

<sup>4</sup> As with the Covid-19 hardship withdrawals introduced in the CARES Act, employers may rely on participants' self-certification that they are experiencing the 'unforeseeable or immediate financial need' that qualifies them for an emergency withdrawal.

<sup>5</sup> Participants who take an emergency withdrawal are not eligible to take another emergency withdrawal until either the total amount of plan contributions they have made since the withdrawal is at least as large as the withdrawal, or three years have elapsed. For example, a participant taking a \$1,000 withdrawal reestablishes eligibility after making \$1,000 in subsequent elective

contributions. Our definition of “repayment” is more stringent than the one used for eligibility purposes: we consider repayment to be an increase in the contribution rate that maintains participants’ prior contribution activity and returns the withdrawn funds to the 401(k) account.

<sup>6</sup> For more detailed statistics on the size and composition of Vanguard’s (2022) recordkeeping population, see Clark (2023).

<sup>7</sup> Set either by default values in automatic-enrollment plans or by participants’ active choices, the elected contribution rate is the percentage that is multiplied by participants’ earnings to determine the 401(k) contribution amounts deferred from each paycheck. Contribution rates can generally be set only in integer percentage increments (1%, 2%, 3%, etc.). To aggregate elected contribution rates to the monthly level, we take day-weighted averages (e.g., if a participant’s contribution rate changes from 2 to 3% on the 15th day of the month, the corresponding monthly contribution rate is 2.5%). We sum deferral rates across all contribution types available to the participant (e.g., if a participant contributes 3% on a pre-tax basis and 3% on a Roth basis, we compute the elected contribution rate as 6%). To restrict focus to the payroll deferral burden borne by participants themselves, we consider only employee contributions and exclude all employer contributions.

<sup>8</sup> 401(k) loan default occurs when participants fail to make the required repayments on time. This can occur during employment if participants inform the employer that they no longer wish to have repayments deducted from their paychecks (or if repayments were collected through other means, like checks or electronic transfers, and participants unilaterally cease those transactions). Employers may also require that the full amount of any outstanding loan balances be repaid at the time of separation, and defaults can occur when separating participants are unable or unwilling to meet this accelerated repayment requirement. The outstanding balance at the time of default is

treated as an early distribution, on which participants must pay income taxes and a 10% penalty. See Lu et al. (2017).

<sup>9</sup> Contribution suspensions tied to loan issuance are rare in our sample; most of the suspensions in Figure 2 occurred because the participant took a hardship withdrawal after loan issuance.

<sup>10</sup> Employer contributions need not decrease by the same amount as employee contributions in Figure 5. This is because: i) match schedules can award employer contributions in ratios other than 1:1 (e.g., 0.5:1 or 2:1); ii) participants already receiving the maximum employer match do not lose employer contributions until their contribution rate falls below the maximum-match threshold; and iii) some employer contributions are non-matching contributions that do not depend on the employee's contribution activity.

<sup>11</sup> This increase in the elective contribution rate could be temporary (lasting for 18 months or some other timeframe) or permanent. A temporary increase would ensure that the original withdrawal is repaid (or approximately repaid) within a specified timeframe. A permanent increase could be used to encourage a sustained savings increase among participants who may be likely to take additional liquidity-based distributions in the future (since emergency withdrawals can be taken once per year, and current withdrawal activity may predict future withdrawal activity).

<sup>12</sup> Explicit repayment transactions and incremental elective contributions would have similar tax and eligibility consequences for most participants; see above.

<sup>13</sup> Explicit repayments offset the taxable income generated by the original withdrawal. Incremental elective contributions do not erase the withdrawal's income tax liability, but if they are made on a pre-tax basis then they reduce the participant's taxable income by the same amount and thus would have a similar effect on the participant's ultimate tax bill. One minor difference between the two methods could arise from repayment timing: if an explicit repayment is made in a different tax

year than the original withdrawal, the participant may have to amend the prior tax return rather than reducing taxable income in the current tax year. If the participant's marginal tax rate differs between the two tax years, this could cause the tax consequences of an explicit repayment and elective contribution to differ.

<sup>14</sup> In fact, participants are eligible for their next emergency withdrawal if the total amount of elective contributions they have made since the prior withdrawal is at least as large as the prior withdrawal. In other words, participants need not make incremental contributions to reestablish eligibility: as long as their initial contribution rate is sufficiently high, they will restore eligibility simply by maintaining their prior contribution activity. For example, participants who take a \$1,000 emergency withdrawal and have a 4% contribution rate will reestablish eligibility within a year as long as their annual salary is at least \$25,000. This means that most participants will reestablish eligibility in the normal course of their contribution activity, which makes eligibility considerations relatively unimportant from a plan-design perspective.

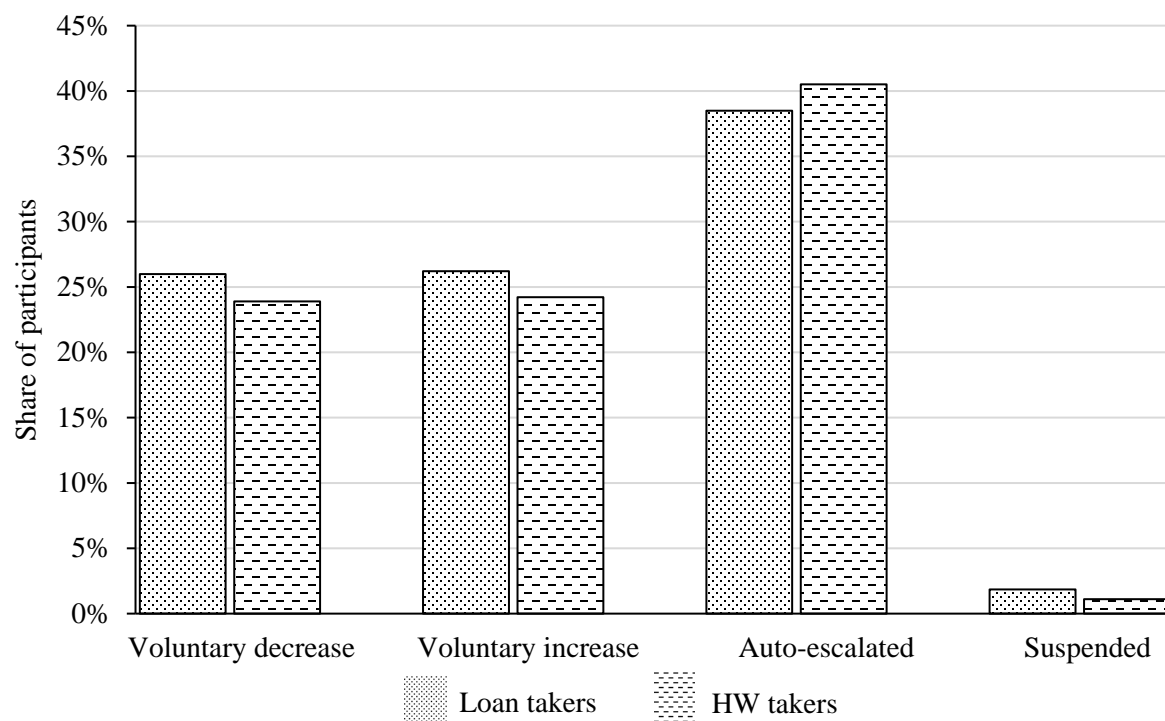
<sup>15</sup> Another difference between the two methods is that elective contributions are constrained by the 402(g) limits on annual employee contributions, whereas explicit repayments are not. Because emergency withdrawal usage is likely to be relatively uncommon among participants contributing at the 402(g) limit, this distinction is unlikely to matter in practice.

<sup>16</sup> One important factor to consider when making this determination is the share of participants who are currently contributing at or above the employer match cap (since these participants do not earn matches on marginal contributions and thus would not have gaming incentives).



## References

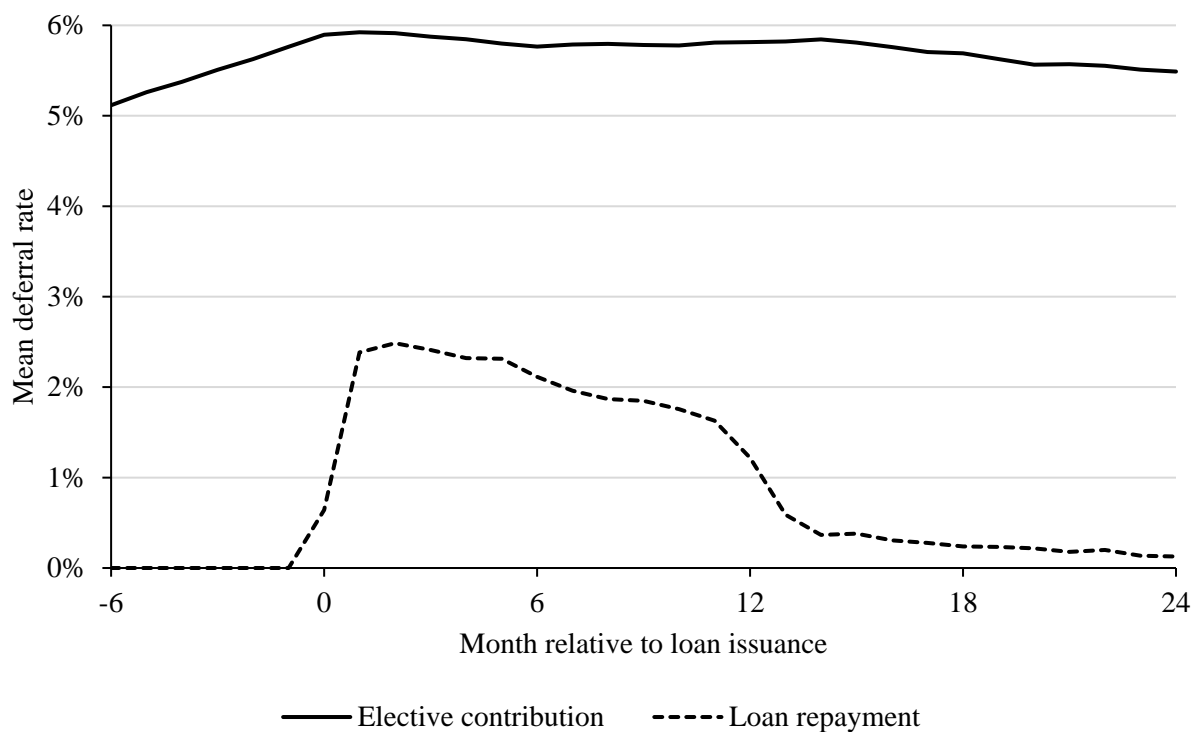
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**Figure 1.** Voluntary contribution decreases following loan issuances and hardship withdrawals (HW) are not typical

*Note:* This plot summarizes contribution rate changes during the two-year period following loan or hardship withdrawal issuance. Voluntary decreases (made at the participant's request) and suspensions (automatic changes that force the contribution rate to zero and are implemented by the plan sponsor) are distinct events. The bars for a given sample may sum to more than 100% because a single participant may exhibit multiple types of contribution rate changes. Results are shown for the 2021 samples of loan and hardship withdrawal takers.

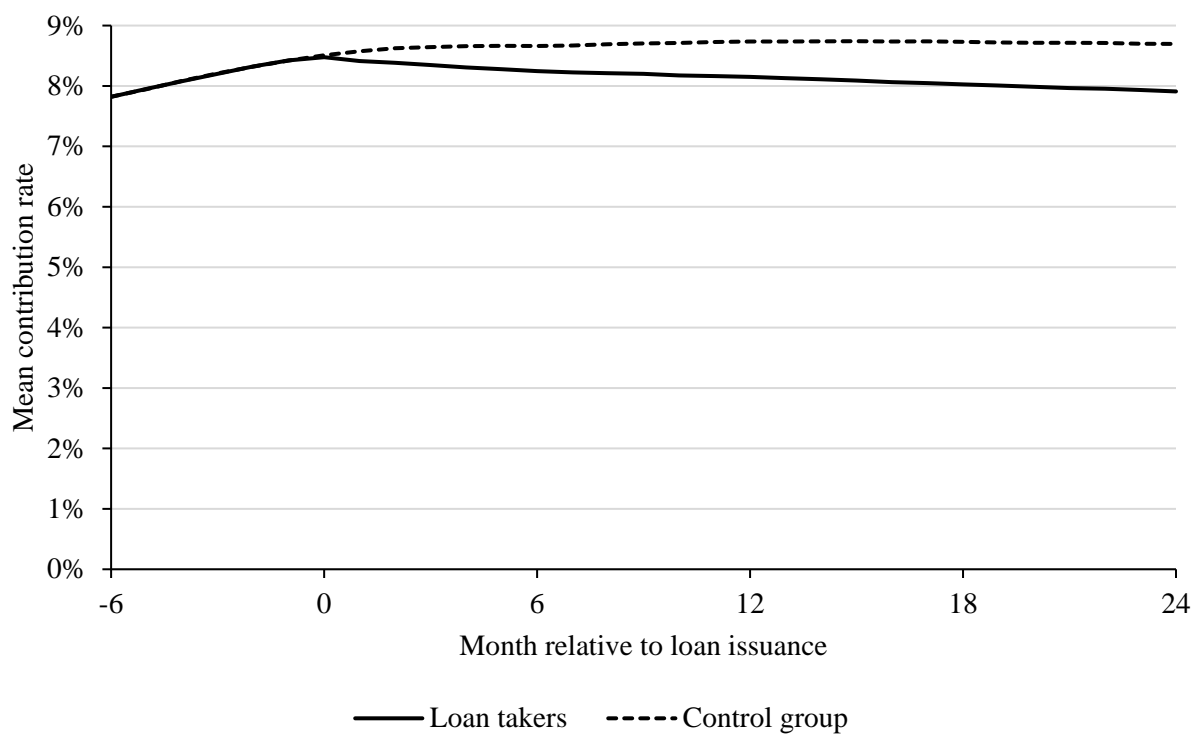
*Source:* Authors' calculations.



**Figure 2.** Elective contribution rates are stable during repayment of small loans

*Note:* We estimate loan repayment rates in the following way. First, we estimate participants' monthly income as (average monthly employee contributions between month -6 and month -1) / (average elective contribution rate between month -6 and month -1). We then divide monthly loan repayment amounts by the monthly income estimate. Loan repayment rates reflect only the loan issued in month 0. Results are shown for participants in the 2021 sample with loan issuances of \$1,000 or less.

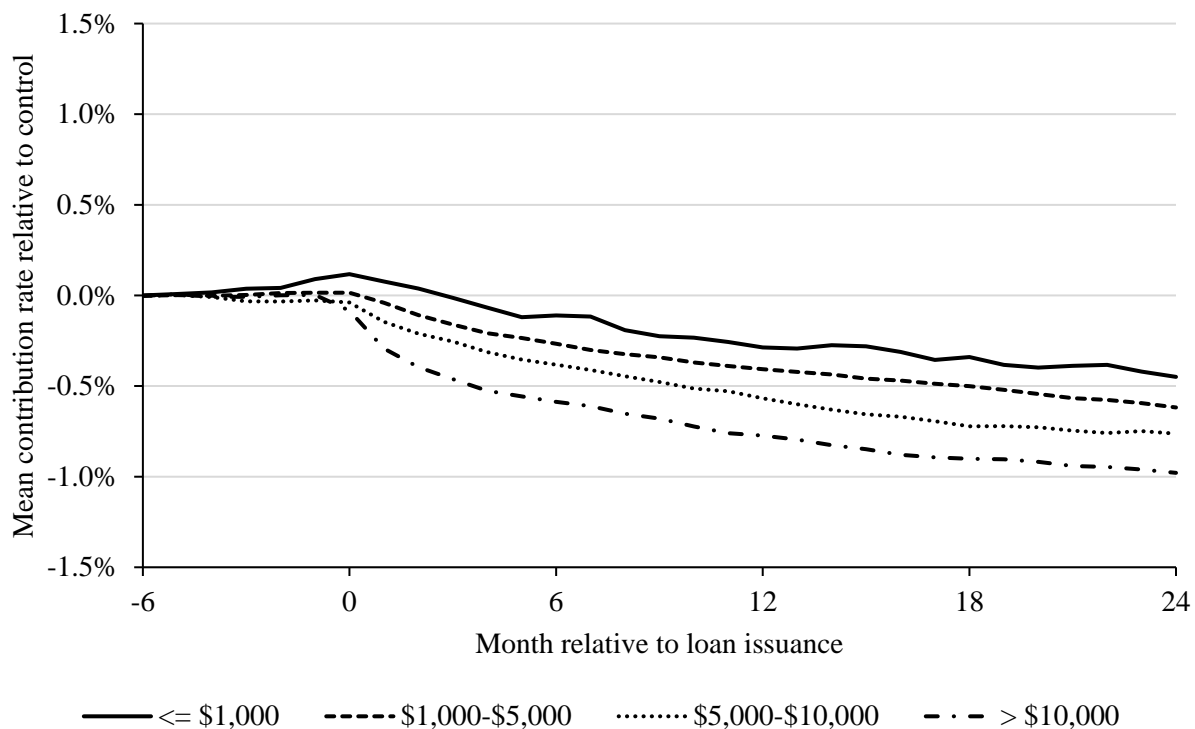
*Source:* Authors' calculations.



**Figure 3.** Loan takers show little crowd-out of elective contributions relative to the control group

*Note:* The control group is selected using the criteria discussed in the text. Results are shown for the 2021 sample of loan takers.

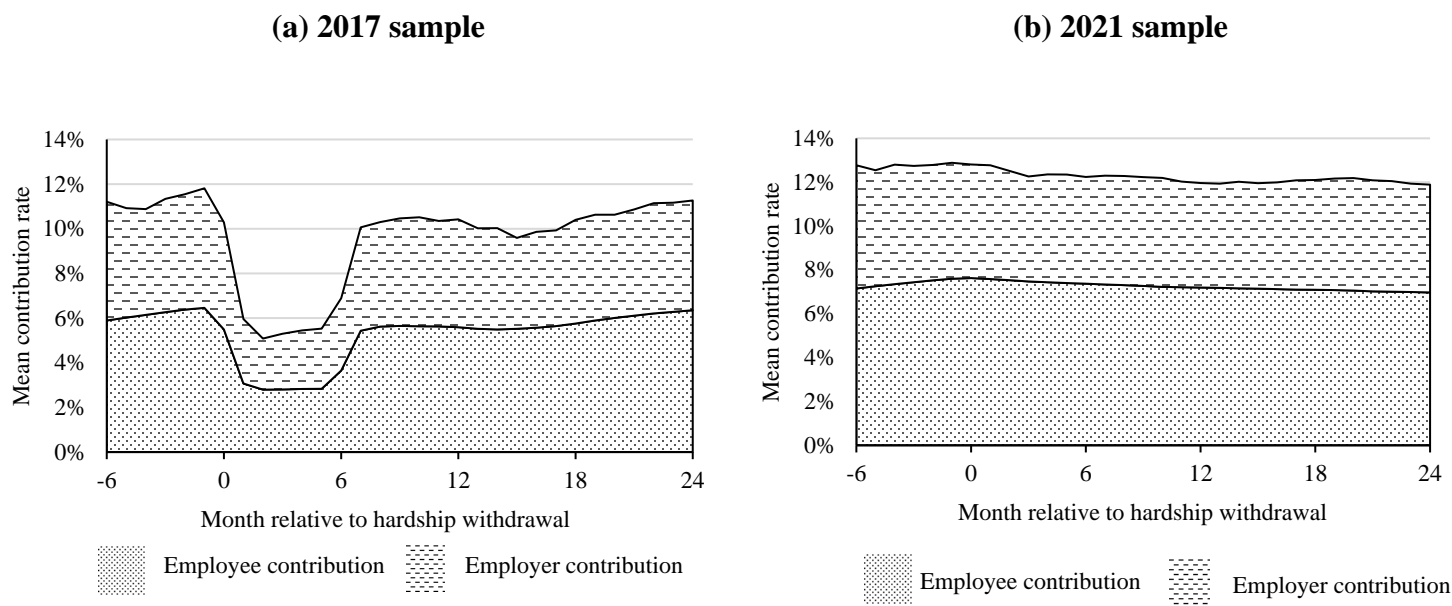
*Source:* Authors' calculations.



**Figure 4.** Loan takers' contribution crowd-out is consistently small across the loan size distribution.

*Note:* This plot shows elective contribution rates for loan takers minus the elective contribution rate for their matched control participant. The results are disaggregated by the principal value of the loan issuance. Results are shown for the 2021 sample of loan takers.

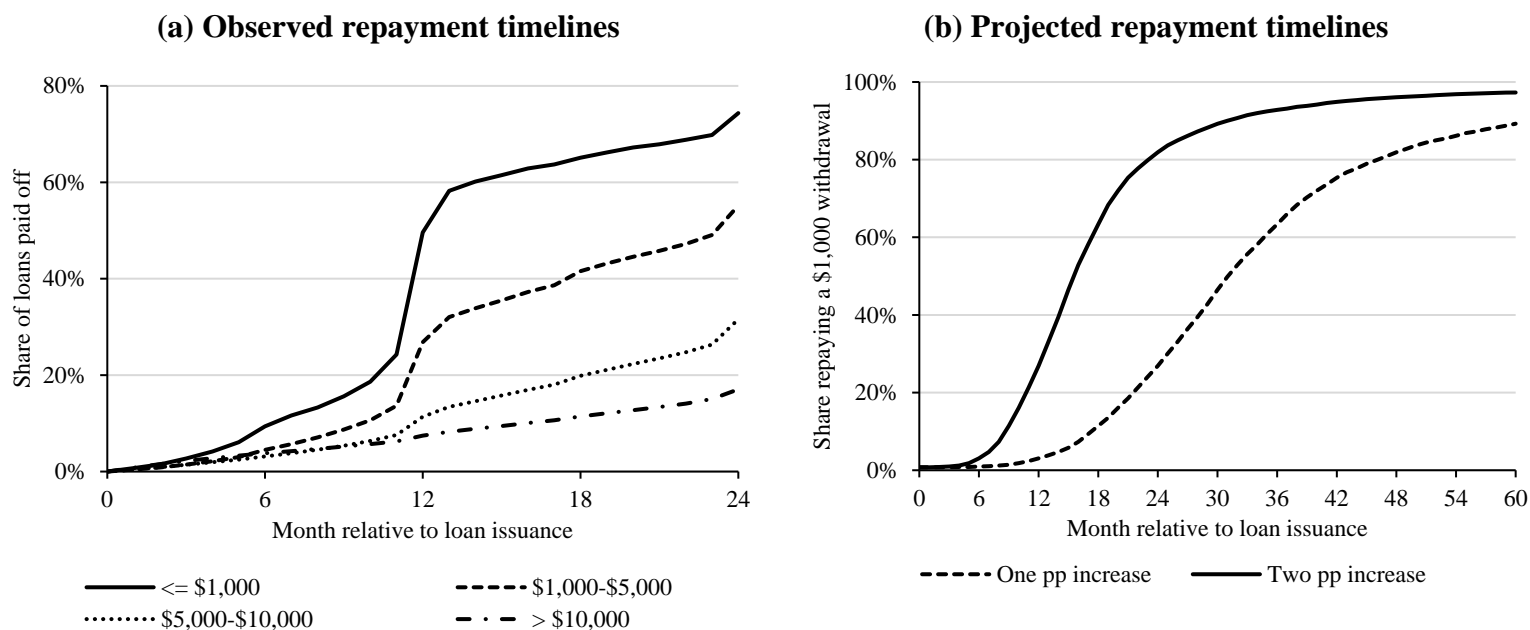
*Source:* Authors' calculations.



**Figure 5.** Hardship withdrawal takers have stable contribution rates when they are not subject to mandatory suspensions.

*Note:* The employee contribution series in these plots reflect participants' elective contribution rates. The employer contribution series are computed in the following way. First, we estimate participants' monthly income as (average monthly employee contributions between month -6 and month -1) / (average elective contribution rate between month -6 and month -1). We then divide monthly employer contribution amounts by the monthly income estimate. Because the employer contribution series are derived from an income estimate and reflect monthly transaction totals (which can vary with the number of paychecks in a month, the timing of quarterly or annual employer contributions, and other factors), they are more volatile than the employee contribution series. An IRS rule requiring six-month contribution suspensions for many hardship withdrawal takers applied to the 2017 sample but not to the 2021 sample.

*Source:* Authors' calculations.



**Figure 6.** Most loans for \$1,000 or less are repaid within one to two years; similar repayment schedules could be accomplished with a two-percentage-point contribution rate increase.

*Note:* Observed repayment timelines in panel (a) are disaggregated by the principal value of the loan issuance and are restricted to loan takers in the 2021 sample who were employed at the same plan sponsor 24 months after loan issuance. In panel (b), the projected repayment timeline for a given participant is computed as  $(1,000)/(X * \text{monthly income})$ , where  $X$  is either 1% or 2%. We estimate participants' monthly income as  $(\text{average monthly employee contributions in the six months before loan issuance}) / (\text{average elective contribution rate in the six months before loan issuance})$ . Projected repayment timelines are shown for the income distribution among participants in the 2021 sample with loan issuances of \$1,000 or less (approximating the size of the new penalty-free emergency withdrawals, which are capped at \$1,000).

*Source:* Authors' calculations.

**Table 1: Summary statistics for loan and hardship withdrawal (HW) samples**

|                              | Loan issuances |         | Hardship withdrawals |         |
|------------------------------|----------------|---------|----------------------|---------|
|                              | 2017           | 2021    | 2017                 | 2021    |
| Median participant age       | 43             | 42      | 42                   | 41      |
| Median plan tenure (years)   | 5              | 5       | 6                    | 5       |
| Estimated annual income (\$) |                |         |                      |         |
| Mean                         | 65,669         | 72,050  | 52,748               | 59,999  |
| Percentiles                  |                |         |                      |         |
| 10th                         | 23,159         | 26,320  | 15,736               | 22,120  |
| 25th                         | 35,870         | 40,229  | 28,699               | 34,992  |
| Median                       | 54,028         | 59,689  | 44,865               | 51,257  |
| 75th                         | 80,158         | 87,098  | 65,789               | 73,457  |
| 90th                         | 114,840        | 125,769 | 93,204               | 103,593 |
| Loan/HW amount (\$)          |                |         |                      |         |
| Mean                         | 10,385         | 11,923  | 6,235                | 8,206   |
| Percentiles                  |                |         |                      |         |
| 10th                         | 1,200          | 1,419   | 604                  | 665     |
| 25th                         | 2,480          | 2,988   | 1,151                | 1,296   |
| Median                       | 6,000          | 7,021   | 2,525                | 2,985   |
| 75th                         | 15,000         | 17,000  | 5,965                | 7,000   |
| 90th                         | 26,035         | 30,000  | 13,475               | 17,627  |
| Number of participants       | 334,406        | 253,300 | 56,405               | 72,118  |

*Note:* If multiple loans were issued for a given participant during one of the sample years, only the first loan issuance for that sample year is considered. Similarly, if a participant took multiple hardship withdrawals during one of the sample years, only the first withdrawal for that sample year is considered. Annual participant income is estimated as (average monthly employee contributions in the six months before loan or hardship withdrawal) / (average elective contribution rate in the six months before loan or hardship withdrawal) \* 12.

*Source:* Authors' calculations.